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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/923,344	08/08/2001	Masumi Kubo	3693-22	2792

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EXAMINER

RAO, SHRINIVAS H

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 04/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/923,344

Applicant(s)

KUBO ET AL.

Examiner

Steven H. Rao

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2001 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Priority***

Receipt is acknowledged of paper submitted under 35 U.S.C. 119(a)-(d), claiming priority from Japanese Paten Application Nos. 2000-244648 filed on November 08, 2000; 2001-131142 filed on April 27, 2001; 2001-155928 filed on May 24, 2001 and 2001-219632 filed on July 19, 2001 which papers have been placed of record in the file.

### ***Information Disclosure Statement***

Acknowledgment is made of receipt of Applicant's Information Disclosure Statement (PTO-1449) filled on August 08, 2001.

The references on PTO 1499 submitted on 08/08/2001 are acknowledged. All the cited references have been considered. However the foreign patents and documents cited by applicant are considered to the extent that could be understood from the abstract and drawings.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2-3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 2-3 the phrase "rotational symmetry and rationally symmetrical shape" renders the claim indefinite because it is not clear applicants' intend to include/exclude by the term "rotational symmetry and rationally symmetrical shape".

Further, the prior art or knowledge of one of ordinary skill in the art does not clarify what Applicants' intend to include/exclude from the claims.

Appropriate correction is required.

*Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1 to 3 and 16 are rejected under 35 U.S.C. 102( e) as being unpatentable over Yoshida et al. (U.S. Patent No. 6,222,599 herein after Yoshida).

With respect to claim1 Yoshida describes a liquid crystal display device comprising: first substrate ( Yoshida fig.1 A # 14 , col. 5 line 50-54); second substrate ( Yoshida fig.1 A # 12 , col. 5 line 50-54); a liquid crystal layer

Art Unit: 2814

disposed between the first substrate and the second substrate( Yoshida fig.1 A # 16 , col. 6 line 1-5) ; and a plurality of picture element regions each defined by a first electrode provided on a face of the first substrate facing the liquid crystal layer and a second electrode provided on the second substrate so as to oppose the first electrode via the liquid crystal layer sandwiched there between, wherein the first electrode includes a plurality of openings and a solid portion in each of the plurality of picture element regions, ( Yoshida figures 3b, 4-5 ,15 etc. , col. 7 lines 12-29,59-60, col.9 lines 21-39) the liquid crystal layer is in a vertical orientation state in each of the plurality of picture element regions when no voltage is applied between the first electrode and the second electrode ( Yoshida fig. 3A , etc. col. 7 lines 30-33), and when a voltage is applied between the first electrode and the second electrode, a plurality of liquid crystal domains each in a radially- inclined orientation state are formed in the plurality of openings ( Yoshida figs. 1B, 3B,etc. and col. 7 lines 33 to 35) and the solid portion by inclined electric fields generated at respective edge portions of the plurality of openings of the first electrode ( Yoshida col.7 lines 35-42), for producing a display by changing orientation states of the plurality of liquid crystal domains in accordance with the applied voltage. ( Yoshida figures 3 and col. 7 lines 40-45).

With respect to claim 2, to the extent understood, Yoshida describes the liquid crystal display device of Claim 1, wherein at least some of the plurality of openings have substantially the same shape and the same size, and form at least one unit lattice arranged so as to have rotational symmetry. (Yoshida figs. 4-5 col. 7 line 58-63, col. 8 lines 1-10). w.3 lines 17-22

With respect to claim 3, to the extent understood, Yoshida describes the liquid crystal display device of Claim 2, wherein each of the at least some of the plurality of openings is in a rotationally symmetrical shape. ( Yoshida figs. 4-5 col. 7 line 58-63, col. 8 lines 1-10).

With respect to claim 16 Yoshida describes a liquid crystal display device comprising:

a first substrate; second substrate; liquid crystal layer disposed between the first substrate and the second substrate; and a plurality of picture element regions each defined by a first electrode provided on a face of the first substrate facing the liquid crystal layer and a second electrode provided on the second substrate so as to oppose the first electrode via the liquid crystal layer sandwiched there between, wherein, in each of the plurality of picture element regions, the liquid crystal layer is in a vertical orientation state when no voltage is applied between the first electrode and the second electrode, and the first electrode includes a plurality of openings disposed at least corners of each of the plurality of picture element regions and a solid portion. ( rejected for reasons stated under claim1 above) .

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action :

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-15 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. (U.S. Patent No. 6,222,599 herein after Yoshida) as applied to claims 1-3 above and further in view of Uemura et al. (U.S. Patent No. 5,636,043, herein after Uemura).

With respect to claim 4. Yoshida describes the liquid crystal display device of Claim 2.

Yoshida does not specifically describe each the of at least some of the plurality of openings is in a substantially circular shape.

However, Uemura describes in at least figure1 # 110 and col. 4 lines 65-67 and col. 6 lines 38 to 43 describes plurality of openings in substantially circular shape to form a device with easier elimination of orientation-related defect during application of high voltage, having no indication of surface roughness and having an improved display quality with its arrangement of polarizing elements optimized.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include Unemera's circular shaped openings instead of the openings described by Yoshida in Yoshida's device to form a device with easier elimination of orientation-related defect during application of high voltage, having no indication of surface roughness and having an improved display quality with its arrangement of polarizing elements optimized. ( Unemera col.4 lines 23-29).

With respect to claim 5. Yoshida describes the liquid crystal display device of Claim 2, wherein each region of the solid portion surrounded with the at least

Art Unit: 2814

some of the plurality of openings is in a substantially circular shape. ( Unemera col.4 lines 23-29). *fig. 1*

With respect to claim 6 Yoshida describes the liquid crystal display device of Claim 2, wherein each region of the solid portion surrounded with the at least some of the plurality of openings is in a substantially rectangular shape with substantially arc-shaped corners. (Yoshida figures 28-30 and Unemera figures 6 a and b).

With respect to claim 7 Yoshida describes the liquid crystal display device of Claim 1, wherein, in each of the plurality of picture element regions, a total area of the plurality of openings of the first electrode is smaller than an area of the solid portion of the first electrode. ( Unemera figure 1).

With respect to claim 8 Yoshida describes the liquid crystal display device of Claim 1, further comprising a protrusion within each of the plurality of openings, wherein a cross-sectional shape of the protrusion taken along a plane direction of the substrate is the same as a shape of the corresponding opening, and a side face of the protrusion has an orientation-regulating force for orienting liquid crystal molecules of the liquid crystal layer in the same direction as an orientation-regulating direction obtained by the inclined electric field. ( Unemera figures 2 to 6 and figure 7 ).

With respect to claim 9 Yoshida describes the liquid crystal display device of Claim 1, wherein the plurality of liquid crystal domains are in a spirally radially-inclined orientation state. ( Unemera figure 8, col. 8 lines 41-60).



With respect to claim 10 Yoshida describes the liquid crystal display device of Claim 9, further comprising a pair of polarizing plates respectively provided outside of the first substrate and the second substrate and disposed with polarizing axes thereof crossing each other substantially perpendicularly, ( Yoshida figure 3 A # 18, 24, col. 7 lines 27-30) wherein, in each of the plurality of liquid crystal domains, assuming that a liquid crystal molecule included in the liquid crystal layer and positioned in a 12 o'clock direction on a display-surface in regard to a center of each of said plurality of liquid crystal domains is inclined against the 12 o'clock direction on the display surface by an angle  $\theta$ , the polarization axis of one of the pair of polarizing plates is inclined in the same direction as inclination of the liquid crystal molecule positioned in the 12 o'clock direction on the display surface by an angle exceeding  $\theta$ -degree and smaller than  $2\theta$  against the 12 o'clock direction on the display surface. ( Unemera figures 8 to 11, col. 8 lines 41- 60).

With respect to claim 11 Yoshida describes the liquid crystal display device of Claim 10, wherein the polarization axis of one of the pair of polarizing plates is inclined by an angle exceeding 0 degree and equal to  $\theta$  or less. ( Unemera examples 3 and 4 , col. 10).

With respect to claim 12 Yoshida describes the liquid crystal display device of Claim 10, wherein the polarization axis of one of the pair of polarizing plates is inclined by an angle substantially the same as  $\theta/2$ . ( Unemera figures 8 to 11, col. 8 lines 41- 60).

With respect to claim 13 Yoshida describes the liquid crystal display device of Claim 10, wherein the polarization axis of one of the pair of polarizing plates is inclined by an angle substantially the same as  $\theta$ . ( Unemera claim 12 , figures 8 to 11, col. 8 lines 41- 60).

With respect to claim 14 Yoshida describes the liquid crystal display device of Claim 1, wherein the solid portion includes a plurality of island portions arranged in the form of an  $m \times n$  matrix and a plurality of branch portions for electrically connecting adjacent pairs of the plurality of island portions, and the number of the plurality of branch portions is smaller than  $(2mn - m - n)$ . (Yoshida col. 7 lines 55-64, Unemura figure 1).

With respect to claim 15 Yoshida describes the liquid crystal display device of Claim 1, wherein the first substrate further includes an active element provided correspondingly to each of the plurality of picture element regions, and the first electrode corresponds to a picture element electrode provided in each of the plurality of picture element regions to be switched by the active element and the second electrode corresponds to at least one counter electrode opposing the plurality of picture element electrodes. (Yoshida col. 7 lines 64 to col. 8 lines 22).

With respect to claim 17 Yoshida describes the liquid crystal display device of Claim 16, wherein a region of the solid portion surrounded with at least some of the plurality of openings is in a rotationally symmetrical shape. ( Unemera figures 6 a and b).

With respect to claim 18 Yoshida describes the liquid crystal display device of Claim 16, wherein a region of the solid portion surrounded with at least

Art Unit: 2814

some of the plurality of openings is in a substantially circular shape. ( Unemera figures 6 a and b).

With respect to claim 19 Yoshida describes the liquid crystal display device of Claim 16, wherein a region of the solid portion surrounded with at least some of the plurality of openings is in a substantially rectangular shape with substantially arc-shaped corners. (Yoshida figures 28-30, Unemara figures 6 a and b).


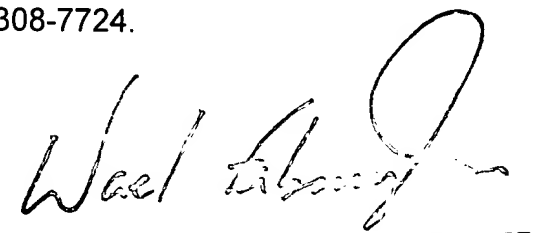
With respect to claim 20 Yoshida describes the liquid crystal display device of Claim 16, wherein the solid portion includes a plurality of island portions arranged in the form of an  $m \times n$  matrix and a plurality of branch portions for electrically connecting adjacent pairs of the plurality of island portions, and the number of the plurality of branch portions is smaller than  $(2mn - m - n)$ . Yoshida col. 7 lines 55-64, Unemura figure 1).

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Steven H. Rao whose telephone number is (703) 306-5584. The examiner can normally be reached on Monday- Friday from approximately 7:00 a.m. to 5:30 p.m.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. The Group facsimile number is (703) 308-7724.

Steven H. Rao

Patent Examiner

  
9/19/03  
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